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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,190

05/31/2006

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NKTR-46238

2286

116 7590 06/07/2010  
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EXAMINER

O'HERN, BRENT T

ART UNIT

PAPER NUMBER

1783

MAIL DATE

DELIVERY MODE

06/07/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,190	<b>Applicant(s)</b> BRAAD, POUL ERIK	
	<b>Examiner</b> BRENT T. O'HERN	<b>Art Unit</b> 1783	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19,21-44 and 46-54 is/are pending in the application.
- 4a) Of the above claim(s) 4-9,30,37,39-44 and 46-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,10-19,21-29,31-36,38 and 50-54 is/are rejected.
- 7) ☒ Claim(s) 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claims***

1. Claims 1-19, 21-44, and 46-54 are pending with claims 4-9, 30, 37, 39-44 and 46-49 withdrawn.

## **WITHDRAWN OBJECTIONS/REJECTIONS**

2. All objections/rejections of record in the Office action mailed 11/18/2009 have been withdrawn due to Applicant's amendments in the Paper filed 3/17/2010.

## **NEW OBJECTIONS**

### ***Claim Objections***

3. Claim 31 is objected to because of the following informalities: claim 31 depends on withdrawn claim 30. Appropriate correction is required.

## **NEW REJECTIONS**

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 112***

5. Claims 1-3, 12-17, 19, 21-29, 36 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. The phrase "comprising ...having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film" in claim 1, lines 2-4 is vague and indefinite because the "comprising" language implies there is a film layer, however, the "having a

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thickness of 1 mm or less” includes a lower limit of “zero” which implies that the film layer is optional. Thus, it is unclear whether the film layer is required or optional.

Clarification and/or correction required.

***Claim Rejections - 35 USC § 102/103***

7. Claims 1-3, 12-17, 19, 21-29, 36, 38, 50-52 and 54 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hardy (US 5,514,312) in view of Procida et al. (US 2001/0021426).

The phrase “having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film in claim 1, lines 2-4 in interpreted as non limiting as it includes values of “zero”.

Regarding claims 1, 10-17, 19, 22-28, and 50-52, Hardy ('312) teaches a flexible impervious unbonded pipe usable for offshore oil production installations and being subject to severe chemical and temperature conditions (*See FIG-3, pipe #11 and col. 14, ll. 12-42, col. 1, ll. 10-38, col. 5, l. 53 to col. 6, l. 4, col. 24, ll. 17-34.*) the pipe comprising at least one polymer layered bonded to at least one film layer (*See col. 14, ll. 12-42, col. 5, l. 53 to col. 6, l. 4 and FIG-3, pipe #11 with multiple plastic and metal reinforcement layers 12-17 bonded to each other and usable for sub-sea drilling. The claims do not distinguish between chemical and mechanical bonding.*) the polymer layer having a thickness of 4 mm or more/(between 4 and 20 mm) (*See col. 20, ll. 20, 37, 45-46, where the thickness of the inner layer is between 5 and 10 mm with the outer layers individually or in combination of sublayers being of greater thickness since they are structural layers.*) and inherently teaches the film layer providing a fluid permeation

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barrier against one or more or all of the fluids methane, hydrogen sulphides, carbon dioxides and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar, the bonding between the polymer layer and the film layer is stronger than the internal bondings in one of the polymer layer and the film layer, the film layer is a layered material, and all interface bondings including bondings between layers of the film and bonding between the polymer layer and the film layer, are stronger than the internal bondings in one of the polymer layer and the film layer, the interface bonding(s) is/are stronger than the internal bonding of the polymer layer, the interfacial bonding between the polymer layer and the film layer is sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxides pressure on the film side of the pipe, the bonding between the polymer layer and the film layer has a peel strength using ASTM D3330 of at least 300 N/m, the bonding between the polymer layer and the film layer is stronger than the cohesive forces in one of the polymer layer and the film layer measured by 90° peel test, the film layer provides a fluid permeation barrier against at least one of the fluids selected from methane, hydrogen sulphides, carbon dioxides and water, which is at least 50% higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar, the film layer is essentially impermeable to at least one of the fluids selected from hydrogen sulfides, methane, and carbon dioxide, at a partial pressure for the respective fluid on a first side of the layer of at least 0.03 bars measured at about 50 °C and a pressure difference of 50 bar, the film layer is essentially impermeable to H<sub>2</sub>O,

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measured at about 50 °C and a pressure difference of 50 bar, the film layer is essentially impermeable to hydrogen sulfides at a partial pressure of at least 0.03 bars at a temperature of about 25 °C and a pressure difference of 50 bar, the film layer is essentially impermeable to methane at a partial pressure of at least 1 bar at a temperature of about 25 °C and a pressure difference of 50 bar, the film layer is essentially impermeable to carbon dioxide, at a partial pressure of at least 1 bar at a temperature of about 25 °C and a pressure difference of 50 bar, the polymer layer being bonded to said film layer, and the interfacial bonding between the polymer layer and the film layer being sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxide pressure of 5 bar on the film side of the pipe, the bonding between the polymer layer and the film layer has a peel strength using ASTM D3330 of at least 300 N/m (*See col. 2, l. 41 to col. 3, l. 28, col. 5, l. 53 to col. 6, l. 4, col. 21, ll. 20-51 and col. 22, ll. 27-37 where the multilayer pipe usable for offshore oil production installations is the same and provides a fluid permeation barrier against crude oil, methane and sea water at pressures up to 100 bar and temperatures above 100 °C with the inner polymeric film layer being the impervious layer and the other polymeric layers being structural layers and not serving as impervious layers, thus, the inner impervious layer clearly has higher barrier properties than the other polymeric layers.*).

A person having ordinary skill in the art would obviously appreciate or provide a pipe with the above structure and where the inner layer has greater barrier properties than the other thicker layers individually or in combination so as to provide a barrier at

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the location of crude oil and not subject the other layers to being comprised. Hardy's ('312) product obviously needs to have the above properties since it needs to be capable of being used in offshore drilling. Thus, a rejection under 35 USC 102/103 is proper (*See MPEP 2112.*).

In the alternative, if one were to interpret the film layer as not being optional then it would have been obvious to provide a film layer with a thickness of 1 mm in view of Procida ('426). Procida ('426) teaches flexible, unbonded pipe for offshore oil/gas fields (*See Abstract and para. 1*) which is the same use as Hardy ('312) and Applicant having films with a thickness being approximately 2 mm for pipes having diameters of about 20 inches (508 mm) (*See paras. 91 and 6.*) for the purpose of transporting oil/gas with a flexible pipe (*See paras. 1-3.*). A person having ordinary skill in the art would interpret a film layer that is approximately 2 mm to include a layer having a thickness of about 1 mm when considering the context of the greater pipe having a diameter of about 508 mm. Both 1 mm and 22 mm have thicknesses that are less than 0.4% of the diameter of the pipe. In the alternative it would have been obvious to provide a thickness as thin as possible, including 1 mm.

Regarding claim 2, Hardy ('312) teaches wherein the polymer layer comprises polyolefins or polyamides (*See col. 14, ll. 12-42, col. 1, ll. 10-38 and col. 25, ll. 12-30.*).

Regarding claim 3, Hardy ('312) teaches wherein the polymer layer comprises cross-linked polyethylene (XLPE) (*See col. 14, ll. 12-42, col. 1, ll. 10-38 and col. 5, ll. 53-65.*).

Regarding claims 10-11, 18, 31-35, and 53, Hardy ('312) teaches the pipe discussed above, however, fails to expressly disclose the surface of the film facing the polymer layer comprises a primer, wherein the innermost polymer layer of the two polymer layers being PVDF and the polymer layer on the in radial direction outermost of the two polymer layer is cross-linked polyethylene (XLPE), wherein the innermost polymer layer of the two polymer layers is cross-linked polyethylene (XLPE), the film layer is in the form of a tape wound around an innermost polymer layer, the film layer is in the form of a tape folded around an innermost polymer layer, wherein said pipe comprises one or more innermost unbonded armouring layers (carcass), the polymer layer being thicker than said film layer, said film layer being a wounded or folded film layer, and said polymer layer being bonded to said film layer and the bond the polymer layer to the film layer via one or more bondings selected from the group of chemical bondings and physical bondings and wherein the polymer layer is bonded to the film layer via one or more bondings comprising at least one of the chemical bondings selected from the group of ion bondings and covalent bondings.

Regarding the bonding, Hardy ('312) teaches the pipe discussed above and where it would have been obvious to bond the polymer layer to the film layer via one or more bondings selected from the group of chemical bondings and physical bondings and wherein the polymer layer is bonded to the film layer via one or more bondings comprising at least one of the chemical bondings selected from the group of ion bondings and covalent bondings so as to provide an effective structure suitable for its intended purpose (*See col. 12, ll. 31-59 and col. 5, ll. 53-65.*).



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However, Procida ('426) teaches a flexible offshore oil and gas unbonded multilayer pipe (*See FIG-1, #1 and paras. 1, 41-45 where the pipe is made from layers having different composition as well as sublayers with the same composition.*) where the inner liquid impervious barrier layer made from polyethylene polyolefins, PVDF or polyamides that is resistant to blistering (*See FIG-1, #3 and paras. 33 and 37.*), reinforcement layer (*See FIG-1, #4.*), tensile reinforcement layer (*See FIG-1, #5.*), metal wires (*See FIG-1, #6.*) and outer sheath (*See FIG-1, #7.*) for the purpose of providing a flexible pipe with low permeability to H<sub>2</sub>S and CO<sub>2</sub> that is suitable for transporting oil and gas from offshore fields (*See paras. 1 and 52.*). Procida's ('426) multilayer flexible long unbonded pipe is also made of the same generic structure, polymeric materials and other materials that are usable and functional in off shore application and subject to the same conditions as Applicant's invention, such as elevated pressures and temperatures, marine conditions, chemicals, etc. associated with sub-sea drilling operations. The polymeric structure can be thicker or thinner, with sublayers, depending on the contemplated use. The methods of manufacturing including various cross-linking, heating systems and exposure times vary depending on how the product is used and the compositions and thicknesses of the layers. The layers can be coextruded, extruded into or onto other layers or prepared individually and subsequently united. Thus, because of the above variable and differing formulations, the bonding strengths and relative bonding strengths vary accordingly. Procida's ('426) multilayer flexible long unbonded pipe is bonded to a liquid impervious barrier layer for the

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purpose of providing a flexible pipe with low permeability to H<sub>2</sub>S and CO<sub>2</sub> that is suitable for transporting oil and gas from offshore fields (*See paras. 1 and 52.*).

Therefore, it would have been obvious to a person having ordinary skill in the art that Hardy's ('312) pipe as modified by Procida ('426) either has the above properties or it would have been obvious through routine manufacturing and optimization at the time Applicant's invention was made to select the above materials and use a known effective manufacturing processes in order to provide a flexible unbonded pipe having the above properties that is suitable for offshore piping.

Regarding claim 21, Hardy ('312) teaches wherein the film layer has a thickness of about 25  $\mu$ m or more (*See col. 20, ll. 20, 37, 45-46, where the thickness is between 6 and 10 mm.*).

Regarding claim 29, Hardy ('312) teaches wherein the film layer is the innermost layer of the film layer and the polymer layer (*See col. 14, ll. 12-42 and FIG-3, pipe #11 with innermost layer #12.*).

Regarding claim 36, Hardy ('312) teaches wherein the film layer comprises C atoms, the polymer being a cross-linked polymer with bondings linking to the C atoms of the film layer (*See col. 14, ll. 12-42 where the film layer is cross-linked PE with C atoms.*).

Regarding claim 38, Hardy ('312) teaches wherein the pipe comprises at least one unbonded armouring layer on the outer side of the polymer layer bonded to said film layer (*See col. 14, ll. 12-42 and FIG-3, flexible pipe #11 with armored layers #16. The claim does not require direct bonding.*).

Regarding claim 54, Hardy ('312) teaches a flexible unbonded pipe (*See FIG-3, pipe #11 and col. 14, ll. 12-42.*), the pipe comprising at least one polymer layer and at least one film layer, the polymer layer being a cross-linked polyethylene and the polymer layer being bonded to said film layer, and the bondings being established by the cross-linking of the polyethylene (*See col. 14, ll. 12-42, col. 1, ll. 10-38, col. 5, l. 53 to col. 6, l. 4, col. 24, ll. 17-34 and FIG-3, pipe #11 with multiple plastic and metal reinforcement layers 12-17 usable for sub-sea drilling. The claim does not require direct bonding.*).

#### **ANSWERS TO APPLICANT'S ARGUMENTS**

8. In response to Applicant's arguments (*See pp. 17-18 of Applicant's Paper filed 3/17/2010.*) that the claimed film layer thickness of "1 mm or less" does not include values of zero as the MPEP's reference to the terms "up to" includes zero as a lower limit and "up to 5%" includes "0% only refers to "Numerical Ranges and Amounts Limitations" and Applicant's thickness of "1 mm or less" is not a "numerical range" or an "amounts limitations", it is noted that Applicant's arguments are not persuasive. Applicant's arguments actually support the Examiner's position instead of a contrary position. The film layer thickness in claim 1 is a numerical range from 0 mm to 1 mm and a thickness of 0 mm is non limiting. This above issue can easily be resolved by including thickness values that are non zero.

9. In response to Applicant's arguments (*See p. 18 of Applicant's Paper filed 3/17/2010.*) that the film layer thickness of 0 mm does not make sense, thus, one should not interpret the claims to include a thickness of 0 mm, it is noted that said argument is

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not persuasive. If a thickness of 0 mm does not make sense then Applicant is advised to set forth a thickness range that does make sense. Furthermore, a polymer layer of 10 times zero is zero.

**10.** In response to Applicant's arguments (*See p. 18 of Applicant's Paper filed 3/17/2010.*) that Hardy does not teach a polymer layer that is 10 times as thick as the film but rather values of 6, 5 or 10 mm, it is noted that said arguments are moot as the language is non limiting.

**11.** In response to Applicant's arguments (*See pp. 18-19, para. 2 of Applicant's Paper filed 3/17/2010.*) that Hardy does not disclose a film layer being a barrier at 50 °C and a pressure difference of 50 bar, it is noted that Hardy teaches where the multilayer pipe is the same and provides a fluid permeation barrier against crude oil, methane and sea water at pressures up to 100 bar and temperatures above 100 °C with the inner polymeric film layer being the impervious layer and the other polymeric layers being structural layers and not serving as impervious layers (*See col. 2, l. 41 to col. 3, l. 28, col. 21, ll. 20-51 and col. 22, ll. 27-37.*), thus, the inner impervious layer clearly has higher barrier properties than the other polymeric layers.

**12.** In response to Applicant's arguments (*See pp. 19-21, para. 3 of Applicant's Paper filed 3/17/2010.*) that Hardy does not teach the layers being bonded as Hardy's pipe would not be flexible if the layers were bonded, it is noted that said arguments are not persuasive. The claims do not identify how the layers are bonded to each other. Nothing defines the bonding as chemical or mechanical bonding. Just because layers are bonded to each other does not mean the pipe is not flexible. Both Applicant's

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invention and Hardy are directed to unbonded pipes which means that at least two of the layers are not bonded to each other. Some of Applicant's and Hardy's layers are not bonded to each other, thus, both of these pipes are flexible with bonded layers. Applicant is advised to consider more precisely defining its bonding configuration.

**13.** In response to Applicant's arguments (*See pp. 21-22 of Applicant's Paper filed 3/17/2010.*) that Procida does not teach the film thickness, relative film thickness or the barrier properties at 50 °C and 50 bar or the bonding, it is noted that Procida is not cited for such.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRENT T. O'HERN whose telephone number is (571)272-6385. The examiner can normally be reached on Monday-Thursday, 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brent T O'Hern/  
Examiner, Art Unit 1783  
May 21, 2010